

CLAIMS

What is claimed is:

- Sub B1* →
1. An apparatus, comprising:
a base;
a device connected to the base; and
a cover including a plastic body and at least one electrically conductive lead, wherein the body is connected to the base such that the device is enclosed by the cover, and wherein the electrically conductive lead includes an exposed portion electrically connected to the device.
 2. The apparatus of claim 1, wherein an inner surface of the body of the cover and an upper surface of the device define an air gap therebetween.
 3. The apparatus of claim 2, wherein the inner surface of the body of the cover includes a sidewall connected to the base.
 4. The apparatus of claim 1, wherein the base includes an electrically conductive baseplate on which the device is mounted.
 5. The apparatus of claim 1, wherein the base includes a substrate on which the device is fabricated.

6. The apparatus of claim 5, further comprising:
at least one electrically conductive via extending from a first surface of the substrate to a second surface of the substrate; and
at least one electrically conductive ball connected to the electrically conductive via.
7. The apparatus of claim 1, wherein the base includes a dielectric material.
8. The apparatus of claim 1, further comprising an electrically conductive bump between the exposed portion of the lead and the device.
9. The apparatus of claim 1, wherein the body of the cover includes liquid crystal polymer.
10. The apparatus of claim 1, wherein the device includes a semiconductor device.
11. The apparatus of claim 10, wherein the semiconductor device is selected from the group consisting of an integrated circuit, an RF device, and a microwave device.
12. The apparatus of claim 1, wherein the device includes a MMIC.
13. The apparatus of claim 1, wherein the device is selected from the group consisting of a MEMS device, an optoelectronic device, a crystal device, an acoustic wave device, and a capacitor.

Sub B2

14. An apparatus, comprising:
a base;
a device connected to the base;
a cover including a plastic body and at least one electrically conductive lead, wherein the body is connected to the base such that the device is enclosed by the cover such that an inner surface of the body of the cover and an upper surface of the device define an air gap therebetween, and wherein the electrically conductive lead includes an exposed portion; and
an electrically conductive bump electrically connected between the device and the exposed portion of the electrically conductive lead.

15. An apparatus, comprising:
an electrically conductive baseplate;
a device connected to the baseplate; and
a cover including a plastic body and at least one electrically conductive lead, wherein the body is connected to the baseplate such that the device is enclosed by the cover, and wherein the electrically conductive lead includes an exposed portion electrically connected to the device via an electrically conductive bump.

16. The apparatus of claim 15, wherein the device includes a semiconductor device.

17. The apparatus of claim 16, wherein the semiconductor device is selected from the group consisting of an integrated circuit, an RF device, and a microwave device.

18. The apparatus of claim 15, wherein the device includes a MMIC.

19. The device of claim 15, wherein:

the device includes a GaAs substrate; and

the baseplate includes a metal selected from the group consisting of CuW and Cu/Mo/Cu.

20. The device of claim 19, wherein the body of the cover includes liquid crystal polymer.

21. The apparatus of claim 20, wherein an inner surface of the body of the cover and an upper surface of the device define an air gap therebetween.

22. The apparatus of claim 21, wherein the inner surface of the body of the cover includes a sidewall connected to the baseplate.

23. A method of packaging a device, comprising:
attaching the device to a base; and
attaching the base to a cover, the cover including a plastic body and at least one electrically conductive lead, such that the body encloses the device and such that the exposed portion of the lead is electrically connected to the device.

24. The method of claim 23, wherein attaching the device to the base includes attaching the device to an electrically conductive baseplate with conductive epoxy.

25. The method of claim 23, further comprising attaching at least one electrically conductive bump to the device prior to attaching the base to the cover, and wherein attaching the base to the cover includes attaching the base to the cover such that the exposed portion of the lead is electrically connected to the device via the bump.

26. The method of claim 25, wherein attaching at least one electrically conductive bump to the device includes attaching at least one electrically conductive bump to the device with conductive epoxy.

27. The method of claim 25, wherein attaching the base to the cover includes:
positioning the base with a pick-and-place machine such that an inner surface of the body of the cover is adjacent to the base and such that the that the exposed portion of the lead is electrically connected to the device via the bump;
curing a conductive epoxy between the bump and the exposed portion of the lead; and
curing an epoxy between the inner surface of the body of the cover and the base.